Instructor Zachary T. Ball zb1@rice.edu
GRB E200C 713.348.6159

Office Hours By appointment. There is no TA for this course.

Course Description An introduction to modern chemical research through seminars and/or directed reading.

Goals This course will introduce students to modern chemical research and to the work of preeminent scientists in the field of chemistry. Assigned readings and discussions will prepare students to understand a critically assess scientific presentations by experts in their field.

Prerequisites Instructor permission is required. Accepted students will typically be declared chemistry majors.

Course Meetings See "course schedule." The course meetings will consist of a mix of departmental seminars and group and individual meetings with the course instructor. **All course meetings are rigorously required.** Please check your schedule now and alert the instructor of any conflicts.

Course materials This course has no textbook. Course readings will be provided online (owlspace.rice.edu).

Requirements and Grades

- This course is graded satisfactory/unsatisfactory ONLY.
- This course has no written assignments.
- Grades are based entirely on attendance (50%), and the quality of participation in class meetings (50%), which will sometimes require preparation in advance.
- Required activities:

Chemistry Departmental Seminars (5)	held Wed. 4–5:15 PM in DBH 180
Full-class meetings in advance of assigned seminars (5)	held Wed. 3–3:40 PM in GRB E200C
Individual discussion meetings with the course instructor (5)	30 min each, to be arranged

Course Expectations Students are expected to complete assigned readings in advance of full-class meetings, and to come to full-class and individual meetings prepared to discuss the readings and oral seminars.

Honor Code The Rice University Honor Code applies to all work conducted in this class. Exams are assumed to be the sole work of the student. You may discuss and research the homework assignments collaboratively, but the answers turned in should be your own.

Disabilities If you have a documented disability that will impact your work in this class, please contact the course instructor to discuss your needs. Additionally, you will need to register with the Disability Support Services Office in the Allen Center.

Schedule

week	date	Time	topic	Assignment	location
1	Aug 26	Wed, 3–3:40	Full-class meeting, introduction		GRB
2–3	Aug 31–Sep 11, no course mtg				
4	Sep 16	Wed, 3–3:40	Full-class meeting	reading #1 due	GRB
5	Sep 23	Wed, 4–5:15	Seminar #1: Yitzhak Tor (UCSD)		DBH 180
6	Sep 28–Oct 2		Individual meetings		
7	Oct 7	Wed, 3–3:40	Full-class meeting	reading #2 due	
8	Oct 14	Wed, 4–5:15	Seminar #2: Arieh Warshel		DBH 180
9	Oct 19–23		Individual meetings		
	Oct 21	Wed, 3–5:15	Full-class & Seminar #3: Laura Fabris	reading #3 due	GRB
10	Oct 26–30		Individual meetings		
11	Nov 4	Wed, 3–5:15	Full-class & Seminar #4: Rafal Klajn	reading #4 due	
12	Nov 9–13		Individual meetings		
13	Nov 16–20	Wed, 4–5:15	Full-class & Seminar #5: Dennis Hall	reading #5 due	DBH 180
14	Nov 23–27, no course mtg		class #12		
15	Nov 30–Dec 4		Individual meetings		

Reading #1 – Conquering 2-Aminopurine's Deficiencies: Highly Emissive Isomorphic Guanosine Surrogate Faithfully Monitors Guanosine Conformation and Dynamics in DNA http://dx.doi.org/10.1021/ja513107r

preparation for Seminar #1: Yitzhak Tor: *New Isomorphic Fluorescent Nucleosides for Studying RNA-based Processes*

Reading #2 – Methyltransferases do not work by compression, cratic, or desolvation effects, but by electrostatic preorganization http://dx.doi.org/10.1073/pnas.1500979112

preparation for Seminar #2: Arieh Warshel: *How to Model the Action of Complex Biological Systems on a Molecular Level*

N.B.: also consider Multiscale Modeling of Biological Functions: From Enzymes to Molecular Machines (Nobel Lecture). http://dx.doi.org/10.1002/anie.201403689

Reading #3 – Gold nanostar substrates for SERS-based chemical sensing in the femtomolar regime http://dx.doi.org/10.1039/C4NR02513J

preparation for Seminar #3: Laura Fabris: *Gold Nanostars: A Tunable Plasmonic Tool for Highly Sensitive SERS-based* Detection

Reading #4 – Light-controlled self-assembly of non-photoresponsive nanoparticles http://dx.doi.org/10.1038/nchem.2303

preparation for Seminar #4: Rafael Klajn: *From dynamically self-assembling materials to chemical reactivity in confined environments*

Reading #5 – *Concise Synthesis and Antimalarial Activity of All Four Mefloquine Stereoisomers Using a Highly Enantioselective Catalytic Borylative Alkene Isomerization* http://dx.doi.org/10.1002/anie.201303931

preparation for Seminar #5: Dennis Hall: title TBA